Large-Scale Demonstration and Deployment Project (LSDDP)
Fact Sheet
C Reactor Interim Safe Storage

In Partnership with the Office of Science and Technology (EM-50)

Introduction

In 1942, the U.S. Government commissioned the Hanford Site for the production of plutonium for use in weapons production. Between 1942 and 1955, eight water-cooled, graphite-moderated production reactors were constructed along the Columbia River.

Objectives

The objectives of the C Reactor ISS LSDDP were:

- Safe storage of the reactor core up to 75 years
- Cannot preclude future D&D goals
- Reduce potential risk to employees
- Minimize releases into the environment
- Reduce inspection to once every 5 years
- Reduce maintenance costs
- Demonstrate more than 20 improved D&D technologies

Technical Needs

The following is a summary of the technology needs addressed:

- Hazardous Materials and Equipment Removal
- Demolition
- Site Restoration
- Surveillance & Maintenance

Technologies Demonstrated

As a result of the screening process, nineteen technologies were ultimately selected and pursued for demonstration in the C Reactor ISS Project. These new and improved technologies were compared against baseline technologies.

Laser-Assisted Ranging and Data System (LARADS): An integration of a modified auto-tracking civil surveyors total station with a radiological detection system and storage of the information into electronic files.

Gamma Ray Imaging: A gamma sensitive shielded/collimation detector that has gamma spectroscopy, laser range finder, and video.

Mobile Integrated Temporary Utilities System (MITUS): Portable trailer-mounted unit substation, utilizing up to twenty portable Kiosks, with international orange cables connecting the Kiosks to the Unit Substation. Each Kiosk is a single unit that includes a power receptacle center, a communication/paging/alarm center, and an emergency lighting pack.

Position Sensitive Radiation Detector: A cart-mounted positional sensitive gas proportional counter radiation monitoring assembly for rapidly collecting, logging and displaying radiological data with 400 measurements per square meter.

Self Contained Pipe Cutting Shears: Handheld battery operated hydraulic shear with a built-in accumulator and rechargeable internal and external batteries that cuts pipes ranging from 1” to 2- 1/2” diameter.

System for Tracking, Remediation, Exposure, Activities and Materials (STREAM): Multimedia database tool for management and staff to enhance and/or facilitate productivity, safety, ALARA principles, ensure compliance, improve communications and training, and assist the

engineering, planning, operations and waste handling organizations throughout the life cycle of a project.

Heat Stress Monitoring System: On-line real-time human vital sense monitoring system to monitor workers for body temperature, heart rate and activity to avoid a potential heat stress/stroke.

Sealed Seam Sack Suits: Protective clothing that is disposable, breathable, and water resistant to assist in avoiding a heat stress situation.

RESRAD-BUILD: Computer program developed to predict radiation exposure of hypothetical receptors occupying a radiologically contaminated structure/buildings.

Concrete Shaving: Self-propelled, electric-powered, diamond-shaving machine that can decontaminate concrete surfaces with extremely accurate tolerances.

Wireless Remote Monitoring System: Electronic personal and area dosimeter, which monitors and displays dose and exposure rates for beta and gamma radiation.

2-D Linear Motion System: Fully computerized 2-dimensional linear motion wall servicing system capable of being equipped with a variety of work modules.

Concrete Diamond Grinder: Lightweight hand-held concrete and coating removal tool that includes a 5" diamond grinding wheel and vacuum port for dust extraction, suitable for flat (or slightly curved) walls and floors, with aerodynamic internal and external air intakes.

Concrete Spaller: Hand-held concrete and coating removal tool with a detachable shroud that has a vacuum port for alpha and beta/gamma decontamination.

Compact Subsurface Investigation System: Compact retrieving soil sampler hydraulically hammers and/or pushs a metal sampling tube below the Fuel Storage Basin concrete floor to assist in the concrete basin demolition.

Automatic Demolition Dust Suppression System: Automatic water dust suppression system for controlling concrete dust generated by a demolition ram (Model 375 Caterpillar excavator fitted with a hoe-ram).

Reactor Stabilization: Coating which can be used to affix radiologically contaminated surfaces that would be left behind during ISS period.

Liquid Nitrogen-Cooled Diamond-Wire Concrete Cutter: Cuts thick concrete walls, floors, and structures dry, utilizing liquid nitrogen for cooling heat diamond concrete cutting wire.

High Speed Clamshell Pipe Cutter: Lightweight, split-frame pipe lathe for severing and/or beveling in-line pipe with a range of 16" through 24" nominal diameter.

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http://www.bhi-erc.com/projects/decom/creactor.htm

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